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ABSTRACT

Materials for a teacher workshop on assessing student needs for vocational English as a Second Language (VESL) are gathered. An annotated workshop outline presents the content and sequence of the workshop. Masters are provided for handouts and transparencies, which include an icebreaker activity, the workshop agenda, materials from the "Dictionary of Occupational Titles" and the "Occupational Outlook Handbook," a list of recommended resources, a chart integrating content areas and language instruction in occupation-specific VESL, general and occupation-specific shop safety, tools, materials, and shop procedures for a number of occupations (auto mechanics, welding, upholstery, electronic assembly, and auto body work), and a checklist for assessing language need in five areas (vocabulary, situations, functions, structures, and register). (MSE) (Adjunct ERIC Clearinghouse on Literacy Education)

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A VESL Staff Development Training Resource Packet

Occupation-Specific VESL Needs Assessment

by

Linda West

Betty Wilkinson

U.S. DEPARTMENT OF EDUCATION
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VESL Staff Development Project

Chinatown Resources Development Center
615 Grant Avenue, 4th Floor
San Francisco, CA 94108

July 1981

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OCCUPATION-SPECIFIC VESL
NEEDS ASSESSMENT

Linda West

Betty Wilkinson

Ice Breaker Activity

- Handout #I can be used to get information about the background of the participants before the session or the presenter can ask questions of the group.
- Presenter can ask each participant to describe his or her teaching situation and what he or she would like to get out of the session.

I. Introduction

A. Discuss or elicit the differences between general ESL, pre-vocational ESL, occupation-specific ESL and ESP.

B. Elicit goals of occupation-specific ESL by asking questions
   1. e.g. "What do you think are the goals of occupation-specific ESL?"
   2. Arrive at the conclusion:
      <u>To provide the student with the necessary language skills to complete vocational training, to get a job and to function satisfactorily on that job</u>.

C. Discuss or elicit a profile of a typical occupation-specific ESL student.
   Profile would include:
   1. Enrolled in vocational training or planning to enroll if VESL is a prerequisite
   2. On some form of public assistance or in a deadend job
   3. Strictly limited time allowed to learn a vocation (i.e. four months to one year; two-year college course)
   4. Education background and language proficiency varies from illiterate to college graduate; most have low to intermediate English level with some high school in his own country

D. Talk about some program models that include occupation-specific ESL.
   1. Bilingual instructors using bilingual materials
   2. Monolingual instructors with bilingual aides using simplified English materials
   3. Occupation-specific ESL and Vocational Training taken concurrently

E. Discuss importance of occupation-specific language being taught concurrently with vocation.

F. Discuss importance of coordination between VESL and vocational instructors.

G. Describe and discuss situations that do not work well:
   1. Mixed vocations in one class
   2. Mixed language groups in bilingual teaching setting (Materials and instruction in native language of only a part of the students)

I. G. (cont.) Poor learning situations for VESL.
   3. Extremes of English levels in same class
   4. Occupation-specific ESL taught too far in advance
   5. Lack of or poor screening; students do not know what they are training for or are in the class for some reason other than to prepare for a job in the field.
   6. Program designers expecting too much of teachers and students. Students' rate of learning, English level, education background, experience, and age must be considered in order to have an employable graduate.

H. Drawbacks and problems of occupation-specific ESL:
   1. VESL instructor not usually familiar with vocational course content
   2. Difficulties of vocational instructor not being available for cooperative effort
   3. Occupation-specific ESL materials not readily available
   4. Inordinate amount of time needed to prepare for this kind of VESL class

I. Advantages of occupation-specific ESL:
   1. Works well with multi-level class
   2. Pre-determined content and competencies take focus away from language learning (back door approach).
   3. Constant mutual reinforcement of vocational and language skills
   4. Increased motivation and rate of learning; students can use more complex structures and make longer utterances than introduced in general ESL

J. Discuss importance of needs assessment.
   1. Adults are in a hurry to complete vocational training and get jobs.
   2. A VESL class does not have time to cover the broad spectrum of language covered in a general ESL class or introduce structures in a neat, progressive manner.
   3. VESL must first determine the language requirements of the vocation and then apply ESL teaching techniques to help the students meet those needs.

K. Present workshop agenda using transparency #1-K.
   In this workshop, we will:
   1. Make a list of sources of information
   2. Talk about how to work with a vocational instructor
   3. Discuss content areas
   4. Think about how to ascertain the language requirements of a vocation
   5. Practice defining the language requirements of a particular vocation

II. Sources of Information to Help Determine Language Needs of Vocation
- Brainstorm with the participants to develop a list of sources.
- Put the sources on the blackboard/overhead.
- Add the following if they are not mentioned.

A. Basic and general information about the vocation.
Situation: You find you are assigned to help LEP students enrolled in a machine shop class. You know nothing about the job. Before you approach the vocational instructor, you want to find out something about the job. Where can you look? (Pass out Handout #II.)

1. Dictionary of Occupational Titles (DOT)
   a. Let participants get a general idea of what DOT is.
   b. Point out the DOT describes the job and qualifications.
   c. Show transparency of table of contents and sample pages. (Transparency # II-A-1 #1, 2, 3, and 4)
   d. Point out section on machine operator.
2. Occupational Outlook Handbook
   a. Let participant get a general idea of what Occupational Outlook Handbook is.
   b. Point out that it describes the nature of the work; places of employment; training, other qualifications, and advancement; employment outlook; earnings; and working conditions.
   c. Show transparencies of table of contents and sample pages to give idea of the nature of this resource. (Transparency II-A-2 #1, 2, 3, 4)

B. Existing vocational educational materials.
1. Vocational materials from vocational instructor
2. Textbooks for English speakers
   a. Point out that students may not be able to read these texts, but they are excellent resources, especially for visuals, vocabulary and outline of scope of vocation.
3. Commercial visuals
   a. Point out commercial publishers on the resource list such as Delmar, and Goodheart-Willcox and A.T.S.
   b. Point out that materials are available for most vocations that are well-established nationwide.
   c. Show samples of catalogs for tools and materials.
   d. Point how commercially available transparencies can be adapted for visuals by eliminating less important labels or dividing the material into manageable sections.
   e. Point out how films, filmstrips and slides can be used without the accompanying sound and with a specially prepared script of commentary.
4. Special education materials or remedial materials designed for native speakers can be adapted, e.g., materials for the deaf may use the same principles as those used for LEP students.
5. Point out the commercial publishers of vocational math materials, such as Delmar, on the resource list.

II. Continued.

C. Jobsite observation.

1. Initial contact
   Try to get an introduction from a vocational instructor or job developer. The best choice is a potential employer or someone who has hired graduates of the training program.
2. Talk to the supervisor about the language requirements of the job.
   Ask questions such as "What does the employee need to know how to understand, say, read, and write?"
3. Spend most of the time observing and listening to the workers in action to find out for yourself what they do and say.
4. Look at signs and notices about the workplace.
5. Determine the conversational situations. Find out who is doing the talking and who is doing the listening.

D. Vocational instructor as a resource.

1. It's crucial to establish a good working relationship with the vocational instructor.
   a. He has the occupational knowledge the VESL instructor has to learn about.
   b. It's his course the VESL instructor is supporting.
2. Ask the vocational instructor for input into the VESL lessons.
   a. Confer with him at every stage of the lessons.
   b. Give him feedback on lesson content on a weekly report.
   c. Get feedback from him on student progress and problems.
3. Such teamwork and coordination takes time but is very valuable. Make your administrator aware of this need.
4. Pointers for getting vocational instructor imput for VESL lessons:
   a. Be aware of his expectations and attitudes:
      - He may expect you to be a tutor or interpreter or that your job is to explain things more slowly and repeatedly.
      - He may doubt your ability to learn about the field or to help the students accomplish their goals.
      - He may have negative feelings about LEP students.
   b. He will not be used to thinking about the vocation in terms of language requirements. He probably will not tc able to identify specific language problems of students.
   c. Be friendly; show respect for his skills and knowledge; show confidence in VESL and how it can help his students through his program.
   d. Avoid general questions or ESL jargon, e.g., "What are some important verbs, nouns, phrases...?"
   e. After your text reading, observation in the workplace and vocational class, ask specific questions.

      Examples of specific questions to ask:
      - I observed the students _____ing _____. Do they do that a lot?
      - What is this called?
      - Are there other names for _____?
      - Is this done this way in most shops?
      - In most shops, do workers have to ask a tool crib attendant for parts or do they get them from a storeroom?
      - How would you describe the common mistakes or causes for rejection for this procedure?

III. Content Areas for the VESL Course

Once the needs assessment is underway and information is gathered, it needs to be organized into content areas and language requirements.
- Brainstorm with participants for a list and cover below in detail.
- Pass out Integrated Handout III and show how each of the sample VESL handouts fit into the grid.

We will now discuss some content areas common to all occupations.

A. Safety.
   1. Discuss the fact that all vocations have safety rules and warnings. Some are general; others are very specific. In some vocations, safety procedures are extremely important (e.g., welding and auto shop).
   2. Refer to sample handouts on safety:
      a. Feuille-Auto Body Repair - Safety Rules (Transparency III-A-#1 and Handout III-A-#1)
      b. Minnesota-Machine Shop - Entanglement (Transparency III-A-#2 and Handout III-A-#2)
      c. Shop Conduct and Safety Rules (Transparency III-A-#3 and Handout III-A-#3)

B. Equipment, tools, machines, and materials.
   1. Discuss the equipment and materials used in various occupations familiar to participants.
   2. Name tools and parts of tools.
   3. Discuss occupations that require special clothing.
   4. Point out that in order for students to understand the safety rules above, they must first know the names of equipment, tools, materials and protect clothing. If possible, it is a good idea to give safety rules to students in their native language at the beginning of the class and teach the rules in English after they have studied the vocabulary for equipment.
   5. Refer to transparencies on tools and equipment:
      a. West-Auto Mechanics - Socket Wrenches (Transparency III-B-#1)
      b. West-Welding - Tig Torch (Transparency III-B-#2)
      c. West-Upholstery - Drop-In Unit Supplies (Transparency III-B-#3)
      d. Wilkinson-Electronic Assembly - Tools and Materials (Transparency III-B-#4)

C. Measurements and math.
   1. Discuss the kinds of math problems and measurements required for various occupations.
   2. Refer to transparencies and sample handouts for various occupations:
      a. West-Welding - Measurement in Welding (Transparency III-C-#1)
      b. West-Auto Mechanics - Starting Motors: Speed and Torque Characteristics (Transparency III-C-#2)
      c. Wilkinson-Electronics - Greek Numerical Prefixes (Transparency III-C-#3)

III. Continued.

D. Procedures and processes.

1. Discuss or elicit from participants procedures found in various occupations familiar to them.
2. Discuss the importance of breaking down the process to the smallest possible steps for teaching VESL. Students need to be able to describe the details when something goes wrong. Flashcards can be made for each step in each procedure. Ordering of steps is important. It is a good place to practice time and sequence words and tense transformations.
3. Appropriate teaching techniques can be mentioned. Presenter can show samples of flashcard drills for above. Total Physical Response can also be demonstrated for a particular procedure.
4. Refer to sample handouts and transparencies from various occupations:
   a. West-Upholstery - Button Making Process (Transparency III-D-#1)
   b. West-Auto Mechanics - Compression Test Strip Story (Transparency III-D-#2)
   c. Feuille-Auto Body - Filling Procedure (Transparency III-D-#3)
   d. Wilkinson-Electronics Assembly - Steps for Making a Solderless Connection (Transparency III-D-#4)

E. Quality control language.

1. Discuss the importance for teaching language related to inspection, workmanship standards, specifications, defects, and corrections. Point out that most occupations have a "rogue's gallery" of poor workmanship for each process. Flashcards or pictures can be used to demonstrate examples of poor workmanship.
2. Refer to sample handouts and transparencies from various occupations:
   a. West-Welding - Arc Welding Defects (Transparency III-E-#1)
   b. West-Upholstery - Sewing Conversation (Transparency III-E-#2)
   c. Wilkinson-Electronics Assembly - Mechanical Connections (Transparency III-E-#3)

F. Job preparation.

Discuss Job Preparation Language Needs such as job application forms, want-ads, getting through an interview, map reading and transportation to job. All of these should be related to the specific occupation and the particular location in which the student will be seeking employment.

IV. Language Requirements of the Vocations

- Discuss the language requirements needed for specific vocations. What does the worker have to understand, say, read, and write? With low level learners, it is crucial to spend the class time on what he needs for the job.
- Point out that the language requirements fall into these five categories: Show Transparency IV-Introduction
  - vocabulary
  - situations
  - functions
  - structures
  - register
- Refer to Handout IV-Introduction showing details of the language requirements. Discuss each of the categories and elicit examples.

A. Vocabulary and phrases.
Tools, machines, parts, materials, processes, job, shifts, departments, products, services, defects, corrections, warnings. (use previous visuals as needed)

B. Situations.
Discuss the situations in which the worker will have to understand or produce English.
Recommend using as a resource:
Industrial English, T.D. Jupp and Susan Holin, Heinemann Educational Books, c 1975.
(Refer to resource handout II-B)

C. Functions.
Discuss the language functions listed on the handout. Get the participants to add to the list for various specific occupations.
Recommend using as a resource:
The Threshhold Level, J.A. van Ek, Council of Europe, Strasbourg, 1975.
(Refer to resource handout II-B)

D. Structures.
For each function, language may be expressed in terms of structures. Refer to study done by Mary Galvan (Resource Development Institute, Austin, Texas) on vocational language which showed that 40% of Vocational language makes use of the imperative form.
Also refer to article by Nick Kremer in English for Specific Purposes, Issue 43, October 1980---"VESL Exchange: Investigating the Language of Work.
Examine certain functions to see what structures are required.

to ask a question-interrogatives
-declaratives with rising intonation

to express agreement-"I agree...."
-"That's right..."
-"Yes, it is."

IV.

D. (Cont.)
to ask permission-"May I + VP?"
-"Can I + VP?"
-"Is it O.K. if I.....?"
-"Do you mind if I....?"

E. Register.

1. Discuss the differences in tone, speaking style, levels of formality, levels of politeness that we use with different people in different situations.
2. Ask the participants to tell how they would give advice to a coworker, supervisor, student, and high-ranking official.
3. Ask participants how they would show disagreement with a co-worker if they were alone; in a group.

V. Practicum

A. Assign or have participants select a job with which most are familiar, e.g. bus boy, gas station attendant, barber, hairdresser, dental assistant.

B. Have the participants work in small groups and report back or have the whole group work together and write the results on the blackboard or overhead.

C. Refer to the Integrated Approach handout and have the participants come up with the content areas for the selected occupation and fill in the grid.

D. After the content areas have been decided, have the group come up with the language requirements for each area.

E. If time permits, have the group continue to think of the activities that could be used to teach each area.

This activity will depend entirely on the amount of time available, and the interest of the group in working out the details.

If this is a long session, the participants could begin to devise materials for a particular vocation in which they are interested.

An alternative activity:
Have the participants choose a common procedure with which everyone is familiar. Ask the group to analyze the procedure and come up with the steps and list them in order.
Procedures which can be suggested:

a. brushing your teeth
b. sewing on a button
c. tune a guitar
d. stripping a piece of furniture
e. repotting a plant
f. washing clothes in a laundomat
g. replacing a light bulb
h. filling a gas tank at a self-service gas station

V. Continued.

The results of the brainstorming for content areas could look like this:

BARBER

EQUIPMENT AND MATERIALS - uniform, scissors, clippers, razors, combs, brushes, towels, sink, mirror, chair, soaps, shampoos, hair tonics, hair dyes, driers, etc.

SAFETY - Rules for using equipment in poor condition, dull razors and clippers; sanitation rules; danger of allergies to soaps and dyes, other possible irritants to skin and eyes.

MEASUREMENTS AND MATH - length of hair, mixing liquids such as lotions and dyes, waving and setting solutions.

PROCEDURES AND PROCESSES - giving a shampoo, haircut, shave, giving a scalp massage or dye job.

QUALITY CONTROL OR INSPECTION - looking for sloppiness, uneven hairlines, hair too thick, too thin, too oily, too dry, irritation, damage to skin or hair or clothes, checking for satisfaction of the customer.

JOB PREP - applications, interviews, awareness of cultural differences in personal hygiene, making small talk with customers.

V. Continued.

The results of the brainstorming session on language requirements should be something like this:

BUS BOY

VOCABULARY CATEGORIES

Table settings - knife, fork, spoon, napkin, tablecloth, glass, plate, etc.
Beverages - water, coffee, tea, milk...
Foods/condiments
Restaurant interior - floor, wall, booth, table, chair, counter, kitchen...
Other workers - waitress, cook dishwasher, manager...
Cleaning implements - mop, rag, bucket, pan...
Verbs - clean, wash, wipe, mop, put away, put in, put back
Adverbs - now, later, well thoroughly

Understanding, high; Speaking, low; Reading and Writing, none.

SITUATIONS

Follow directions - which tables to clean, where to take clean and dirty dishes, mop a spill on the floor...
Explain an absence
Arrange a schedule
Explain to waitress why clean dishes are delayed
Say to washer all dirty dishes are collected
Ask to take a break/go home early

FUNCTIONS

Report a problem
Explain a situation
Express agreement or disgreement
Ask a question
Ask permission

STRUCTURES

Imperatives
Affirmative short answers
Can I + VP / Do you mind + if clause

REGISTER WITH THE FUNCTION OF EXPRESS AGREEMENT

manager	yes, sir
cook	yes, sir
hostess	yes, ma'am
waitress	yes, ma'am
dishwasher	yeah, o.k., sure
another bus boy	yeah, o.k., sure

VESL INTERACTION

Interview conference participants to find individuals who fit the descriptions below. Try to find a different person for each slot.

FIND SOMEONE WHO:

Was raised to be bilingual _____ What languages? _____

_____

Went to a high school where vocational education was stressed _____ Where? _____

Has worked in a factory _____ What kind? _____

Has been in a vocational classroom recently _____ What occupation? _____

Has talked to a job developer _____

Has taught students how to fill out a job application _____

Has taught students the vocabulary and language of a partiuclar occupation _____ Which? _____

Would be comfortable receiving medication or medical treatment from a limited English speaking medical technician _____

*Modeled after activity in Personal and Family Financial Planning for Multicultural Adults, Tibbets and Westby-Gibson.

--Nick Kremer

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OCCUPATION SPECIFIC VESL

NEEDS ASSESSMENT

WORKSHOP

1. Sources of information.

2. How to work with a vocational instructor.

3. Content areas.

4. Language-requirements.

5. Practice defining language requirements.

Dictionary of Occupational Titles

Fourth Edition, 1977

Transparency II-A-1
#1

U S Department of Labor
Ray Marshall, Secretary

Employment and Training Administration
Ernest G Green
Assistant Secretary for Employment and Training

U S Employment Service

SUMMARY LISTING OF OCCUPATIONAL CATEGORIES, DIVISIONS, AND GROUPS

OCCUPATIONAL CATEGORIES

0/1 Professional, technical, and managerial occupations
2 Clerical and sales occupations
3 Service occupations
4 Agricultural, fishery, forestry, and related occupations
5 Processing occupations
6 Machine trades occupations
7 Benchwork occupations
8 Structural work occupations
9 Miscellaneous occupations

TWO-DIGIT OCCUPATIONAL DIVISIONS

PROFESSIONAL, TECHNICAL, AND MANAGERIAL OCCUPATIONS

00/01 Occupations in architecture, engineering, and surveying
02 Occupations in mathematics and physical sciences
04 Occupations in life sciences
05 Occupations in social sciences
07 Occupations in medicine and health
09 Occupations in education
10 Occupations in museum, library, and archival sciences
11 Occupations in law and jurisprudence
12 Occupations in religion and theology
13 Occupations in writing
14 Occupations in art
15 Occupations in entertainment and recreation
16 Occupations in administrative specializations
18 Managers and officials, n.e.c.
19 Miscellaneous professional, technical, and managerial occupations

CLERICAL AND SALES OCCUPATIONS

20 Stenography, typing, filing, and related occupations
21 Computing and account-recording occupations
22 Production and stock clerks and related occupations
23 Information and message distribution occupations
24 Miscellaneous clerical occupations
25 Sales occupations, services
26 Sales occupations, consumable commodities
27 Sales occupations, commodities, n.e.c.
29 Miscellaneous sales occupations

SERVICE OCCUPATIONS

30 Domestic service occupations
31 Food and beverage preparation and service occupations
32 Lodging and related service occupations
33 Barbering, cosmetology, and related service occupations
34 Amusement and recreation service occupations
35 Miscellaneous personal service occupations
36 Apparel and furnishings service occupations
37 Protective service occupations
38 Building and related service occupations

600,380-018 MACHINE SET-UP OPERATOR (elec. equip.; firearms; mach. shop) machine operator, all around; machine operator, general; machinist.

Sets up and operates two or more types of machine tools, such as lathes, milling machines, boring machines, and grinders, to machine metal workpieces according to specifications, tooling instructions, and standard charts, applying knowledge of machining methods: Reads blueprint or job order for product specifications, such as dimensions and tolerances, and tooling instructions, such as fixtures, feed rates, cutting speeds, depth of cut, and cutting tools to be used. Positions and secures workpiece to holding device, machine table, chuck, centers, or fixture, using clamps and wrenches. Positions and secures tool in tool-holder (chuck, collet, or tool-post). Moves controls to position tool and workpiece in relation to set specified feeds, speeds, and depth of cut. Starts machine, turns handwheel to feed tool to workpiece or vice versa, and engages feed. Turns valve handle to direct flow of coolant or cutting oil against tool and workpiece. Observes operation, and verifies conformance of machined workpiece to specifications, using measuring instruments, such as fixed gages, calipers, and micrometers. May set up fixtures or feeding device. May operate bench grinder to sharpen tools. May machine nonmetallic materials. May also set up and operate machines and equipment other than machine tools, such as welding machines and flame-cutting equipment. May have experience with particular material, products, precision level, or size, type or trade name of machine and be designated accordingly, as BARREL REAMER-RIFLER, SPECIAL (firearms); SPECIAL-BARREL PROCESSOR (firearms).

Transparency II-A-2
#1

Occupational Outlook Handbook, 1976-77 Edition

U.S. Department of Labor
W. J. Usery, Jr., Secretary

Bureau of Labor Statistics
Julius Shiskin, Commissioner
1976

Bulletin 1875

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MACHINING OCCUPATIONS

MACHINE TOOL OPERATORS

(D.O.T. 602., 603., 604., 605., and 606.)

Nature of the Work

Many machine tool operators do simple, repetitive jobs that can be learned quickly on one or two types of machine tools. Other more skilled workers do complex and varied machining operations on several different machine tools.

Typically, semiskilled operators place rough metal stock in a machine tool on which the speeds and operation sequence already have been set. By using special, easy-to-use gauges they watch the machine and make minor adjustments. However, they depend on skilled machining workers for major adjustments when their machine is not working properly.

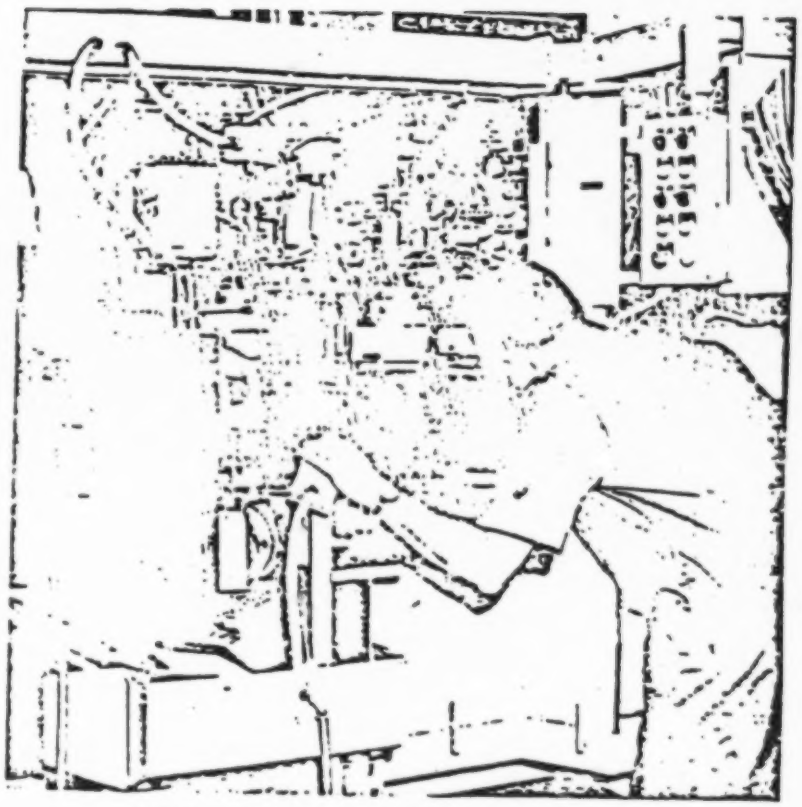
Skilled machine tool operators plan and set up the correct sequence of machining operations according to blueprints, layouts, or other instructions. They adjust speed, feed, and other controls, and select the proper cutting instruments or tools for each operation. Using micrometers, gauges, and other precision measuring instruments, they check the completed work with the tolerance limits given in the specifications. They also may select cutting and lubricating oils to cool metal and tools during machining operations.

Operators use lathes, drill presses, and automatic screw machines. They also use boring, grinding, and milling machines. Both skilled and semiskilled operators have job titles related to the kind of machine they operate, such as engine lathe operator, milling machine operator, and drill press operator.

Places of Employment

About 600,000 machine tool operators were employed in 1974, mainly in factories that produce fabricated metal products, transportation equipment, and machinery in large quantities. Skilled machine tool operators worked in production departments, maintenance departments, and toolrooms.

Machine tool operators work in every State and in almost every city in the United States. However, they are concentrated in major industrial areas such as the Great Lakes Region: About one-fourth of all machine tool operators work in the Great Lakes cities of Detroit, Flint, Chicago, Cleveland, and Milwaukee. Among the other areas that have large numbers of these workers are Los Angeles, Philadelphia, St. Louis, and Indianapolis.



Operator adjusts machine that drills and reams rifle parts.

Training, Other Qualifications, and Advancement

Most machine tool operators learn their skills on the job. Beginners usually start by observing skilled operators at work. When trainees first operate a machine, they are supervised closely by more experienced workers. Beginners learn how to use measuring instruments and to make elementary computations needed in shopwork. They gradually acquire experience and learn to operate a machine tool, read blueprints, and plan the sequence of machining work.

Individual ability and effort largely determine the time required to become a machine tool operator. Most semiskilled operators learn

their jobs in a few months, but a skilled operator often requires 1 to 2 years. Some companies have formal training programs for new employees.

Although no special education is required for semiskilled jobs, persons seeking such work can improve their opportunities by completing courses in mathematics and blueprint reading. In hiring beginners, employers often look for persons with mechanical aptitude and some experience working with machinery. Physical stamina is important since much time will be spent standing. Applicants should be able to work independently within a relatively small work area. Although much of the work is tedious, many machine tool operators derive satisfaction from seeing the results of their work.

Skilled machine tool operators may become all-round machinists, tool and diemakers, or advance to jobs in machine programming and maintenance.

Employment Outlook

Job opportunities for machine tool operators should be fairly plentiful in the years ahead. Because this is a large occupation, many openings arise due to the need to replace operators who retire, die, or transfer to other fields of work. Some openings also will result from employment growth, although employment of machine tool operators is expected to grow more slowly than the average for all occupations through the mid-1980's.

More machine tool operators will be needed as metalworking industries expand their output. However, the use of faster and more versatile automatic machine tools and numerically controlled machine tools will result in greater output per worker and tend to limit employment growth. Other factors that may slow the growth in this occupation are the increasingly important new processes in metal removal, such as electrical discharge and ultrasonic machining, and the use of powdered metals that reduce the machining necessary for a final product.

Workers with thorough backgrounds in machining operations, mathematics, blueprint reading, and a good working knowledge of the properties of metals will be better able to adjust to the changing job requirements that will result from technological advances.

Earnings and Working Conditions

Machine tool operators are paid according to hourly or incentive rates, or on the basis of a combination of both methods. Skilled operators averaged $5.67 an hour in 1973-74, according to a survey of metropolitan areas. By comparison, nonsupervisory workers in private industry, except farming, averaged $4.05. Average hourly rates in 14 of the areas surveyed, selected to show how wage rates of machine tool operators differ in various parts of the country, appear in the accompanying tabulation.

Area	*Hourly rate*
Detroit	$6.36
San Francisco–Oakland	6.32
Chicago	5.96
Cincinnati	5.53
Los Angeles–Long Beach	5.35
Portland, Oreg.	5.24
Denver	5.19
Minneapolis–St. Paul	5.17
Baltimore	5.09
Boston	4.93
Houston	4.93
Waterbury, Conn.	4.60
Worcester, Mass.	4.57
Tampa–St. Petersburg	4.02

Most shops are clean and workplaces are well-lighted. Machine tool operators must use protective glasses and may not wear loose-fitting garments when working around high-speed machine tools.

Most machine tool operators belong to unions, including the International Association of Machinists and Aerospace Workers; the International Union, United Automobile, Aerospace, and Agricultural Implement Workers of America; the International Union of Electrical, Radio and Machine Workers; the International Brotherhood of Electrical Workers; and the United Steelworkers of America.

Sources of Additional Information

See the list under this same heading in the statement on All-round Machinists elsewhere in the *Handbook*.

SETUP WORKERS (MACHINE TOOLS)

(D.O.T. 600.380)

Nature of the Work

Setup workers, often called machine tool job setters, are skilled specialists employed in plants and machine shops that do machining in large volume. Their main job is to prepare machine tools for use (setup), and to explain to semiskilled workers the operations to be performed and ways to check the accuracy of the work. Usually setup workers are assigned a number of machine tools that are of one type, such as turret lathes. However, they may set up several different kinds. Working from drawings, blueprints, written specifications, or job layouts, they determine the rate at which the material is to be fed into the machines, operating speeds, tooling, and operation sequence. They then select and install the proper cutting or other tools and adjust guides, stops, and other controls. They may make trial runs and adjust the machine and tools until the parts produced conform to specifi-

RECOMMENDED RESOURCES

FOR

OCCUPATION-SPECIFIC ESL INSTRUCTORS

GENERAL

Dictionary of Occupational Titles: U.S. Department of Labor, U.S. Employment Service.
(describes job duties and qualifications.)

Occupational Outlook Handbook: U.S. Department of Labor, Bureau of Labor Statistics.
(describes jobs, workplaces, working conditions, earnings, qualifications and trainig, employment outlook.)

U.S. Government Printing Office, Public Documents Department
Washington, D.C. 20402

PUBLISHERS OF VOCATIONAL MATERIALS

Goodheart-Willcox Co., Inc.
123 W. Taft Drive
South Holland, Illinois 60473

American Technical Society
Chicago, Illinois 60637

Delmar Publishers
50 Wolf Road
Albany, N.Y. 12205

Hinricks, Roy S., Measuring: Delmar, 1981

Practical Problems in Mathematics (series)
(workbooks for different vocations)

OCCUPATION SPECIFIC E.S.L.

Jupp, T.D. and Hodlin, Susan, Industrial English: Heinemann Educational Books, Inc., 1975.
4 Front Street, Exeter, N.H. 03833

van Ek, J.A., The Threshhold Level: The Council of Europe, Strasbourg, 1975.

GENERAL E.S.L. TECHNIQUES

Total Physical Response

Romijn, Elizabeth and Contee, Seely, Live Action English for Foreign Students: Alemany Press.

Dyad Practice

Olsen, Judy E. Winn-Bell, Communication Starters: Alemany Press.
P.O. Box 5265 San Francisco, CA 94101 (415) 561-1515

An Integrated Approach to Occupational-Specific VESL

CONTENT AREAS

SAFETY: Safety Rules Emergency Situations	MEASUREMENT AND MATH	PROCEDURES AND PROCESSES	QUALITY CONTROL AND INSPECTION	JOB PREPARATION
First give rules in native lang. if possible; then in English Dangerous conditions; emergencies; avoiding health problems; talking about health problems Warning; requesting help; reporting dangerous conditions Never, always, be sure to__; make sure that; avoid; w/ "to" and "-ing" forms "Why? Why not?" "Because it's dangerous"; "It can hurt you."	Common units; Voc. Spec. units; Math. Lang-Reading Fractions; Decimals; Angles; Math. Operations-add, substract, etc.; reading meters; blueprints and diagrams Making measurements and taking readings; sizes of tools and hardware Identifying; requesting w/sizes; following directions "How is __measured?" "In (units)." "How many___are there in___?"	Voc. used to describe steps in procedures Time words (before, after, as soon as, while, next) Giving & Receiving Instructions; following written & oral directions; reporting completion of step or task Verifying; clarifying; getting more information Simple & compound sentences showing order and sequence "Do X before doing Y." All tenses	Q.C. language-approved, permissible, allowable, rejected, touch up, rework. Describing approved and not approved work. Pointing out errors; getting work approved; correcting rejected work; reading reject slips; reading specifications Asking for approval; asking for cause of rejection; asking how to correct mistakes Modals; yes/no questions with tags: "too__" "not enough"	Application & interview vocab.; want-ad abbreviations; transportation; benefits Getting job info.; interviews; testing; getting to work; discussing cultural differences and discomfort; discussing expectations of employer and employees Greeting prospective employer, showing interest; getting info. about job duties & benefits

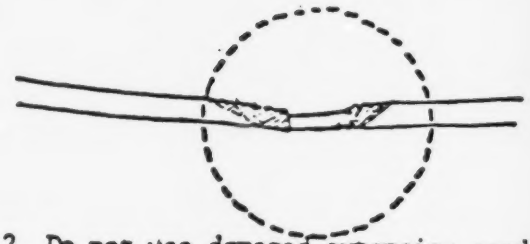
At work, on breaks, or social occasions; making small talk; appropriate degree of Assertiveness in groups or private conversations →

Flashcards; safety posters; T.P.R.; dialogs; role-playing where students act out dangerous situations and give appropriate warnings, and report dangerous conditions and injuries	Tables of common measurements in Eng. & metric systems; rulers; scales; meters; thermometers; timers Students practice with above and describe results Give math problems orally to improve comprehension of figures & measurements Ex. "How many feet in a yard?" "One meter equals how many inches?"	Realia; flashcards, slides; video-tapes T.P.R.; tense drills; pair practice; dialogs; strip stories; dyads Verifying, clarifying, and getting more info. drills Ex. A: Clean the _____. B: How do I clean it? A: Use a _____. B: What kind of a _____?	Specification sheets; standards of workmanship materials; samples of poor workmanship; flashcards Students draw simple pictures of error conditions and describe in pair practice Situational dialog w/ substitutions	Job applications; sample resumes; want-ads; transportation schedules; sample interview questions Intensive practice with above Role-playing interviews Discussion of cultural values and expectations of employers and co-workers

BEST COPY AVAILABLE

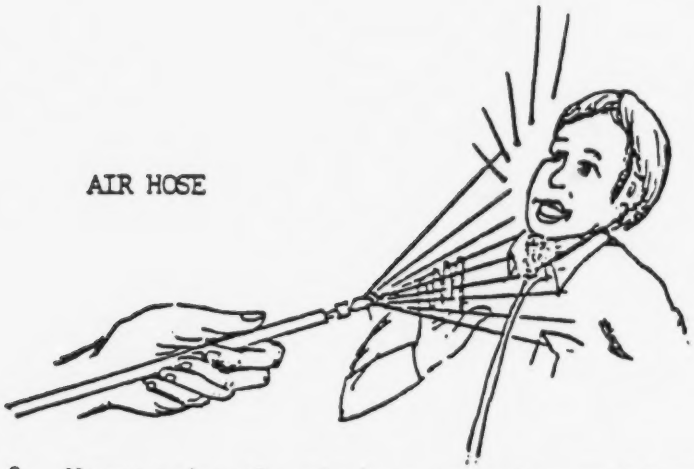
EXTENSION CORDS

1. Keep extension cords out of water.



2. Do not use damaged extension cords.

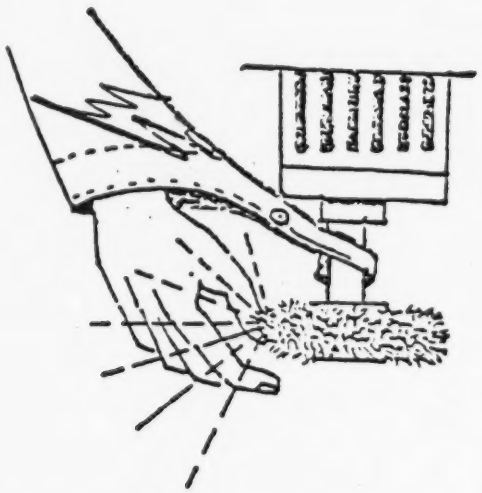
AIR HOSE



3. Never point the air hose toward yourself or others.

BENCH GRINDERS AND BUFFERS

4. Wear goggles to protect your eyes when using bench grinders and buffers.



5. Don't wear loose clothing when using the bench grinders.

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ENTANGLEMENT

Sometimes a machinist gets caught in the moving parts of a machine. This is entanglement. Entanglement can cause cuts, bruises, broken bones, amputation, or suffocation.

SHOP CONDUCT AND SAFETY RULES

1. Observe safety practices
   a. For self
   b. For others
   c. For equipment and stock

2. Avoid interfering with or startling anyone using a hot iron or other equipment.

3. Horseplay, running and throwing of objects are dangerous practices in the shop and are forbidden at all times.

4. Lift soldering irons, hot or cold, only by their handles.

5. Place your soldering iron where you don't have to reach across or around it.

6. When unsoldering a wire, make certain there is no tension or spring to the wire that could cause hot solder to be flipped into your face.

7. Wire excess solder off the iron tip. Never flip it off.

8. When cutting wires, keep the open side of cutter away from your body and keep cut-off wire ends in your work area.

9. Place rags, kim wiper, etc., in a location where they will not be near any hot soldering iron.

10. Keep a protective cover over knife blades.

11. Disconnect all power before working on a chassis.

12. Deep tools and materials from projecting over the edge of benches.

13. Wipe up, immediately, any liquids spilled on the bench or floor.

14. Keep your work area neat and clean. Put waste material into proper receptacles.

15. Keep your soldering iron in its proper receptacle when it is not in actual use.

16. Most tools are designed for a specific use or purpose. If they are used incorrectly the result may cause injury to the student.

17. Never work on any electrical equipment alone.

18. Move slowly; make sure your feet are placed for good balance. Never lunge for tools.

19. Never work on live equipment when fatigued, and always keep one hand in a pocket when working on live equipment.

20. Long hair is dangerous around shop equipment. If it is long enough to get caught in the machine, it must be tied up and back.

21. Do not touch electrical equipment while standing on a damp or metal floor.

22. Do not handle electrical equipment while you or the equipment is not grounded.

23. Do not use water on electrical or oil fires.

24. Never touch two pieces of electrical equipment at the same time.

25. Only the operator and instructor are permitted within the working area around a machine.

26. Never touch even one wire of an electrical line; it may be energized.

27. Remove a victim from an electrical circuit without endangering your safety as quickly as possible. Any delay may prove fatal.

28. To remove excess solder from a soldering iron tip, you wipe it on a cloth.

29. Never attempt to repair or adjust any electrical equipment unless such procedure is part of your duties.

30. All accidents and injuries, no matter how slight, must be reported to the instructor.

31. Grasp the plug not the cord to remove the line-cord from an electrical outlet.

32. Never work on an energized circuit when the instructor is out of the shop.

33. Short sleeves are best for use around drill-presses and other revolving machines. Neckties should not be worn while operating such a machine. This applies to jewelry, rings, bracelets, brooches, and anything that can become entangled in mechanical equipment.

34. When changing components in a electrical circuit, remove the line-cord from the outlet.

35. Safety glasses should be worn by persons working with any rotating machinery, such as; drill presses, sanders, grinders, or any machinery where there is flying materials.

36. Check a soldering iron for heat with solder.

37. Safety glasses must be worn if you are soldering on equipment above eye level.

38. A capacitor can hold a lethal charge of electricity.

39. When working on electrical equipment, turn off all power and ground all high voltage points. Make sure that the power cannot be accidentally restored.

40. Fumes of burning teflon are poisonous. Soldering of teflon must be done in a well-ventilated area.

41. Do not breath carbon tetrachloride fumes.

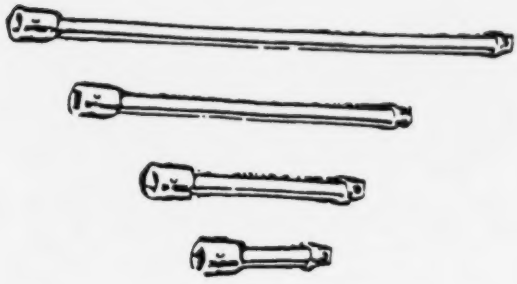
42. Flammable liquids such as paint thinners naptha, and gasoline are not to be used in enclosed areas.

43. Wash your hands thoroughly after using solvents.

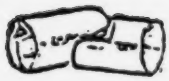
44. Splintered, broken, rough, or loose tool handles must be replaced or repaired before the tools are used.

Socket Wrenches

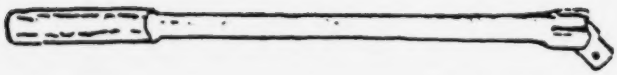
ratchet



extensions



universal joint



breaker bar

speed handle

nut driver

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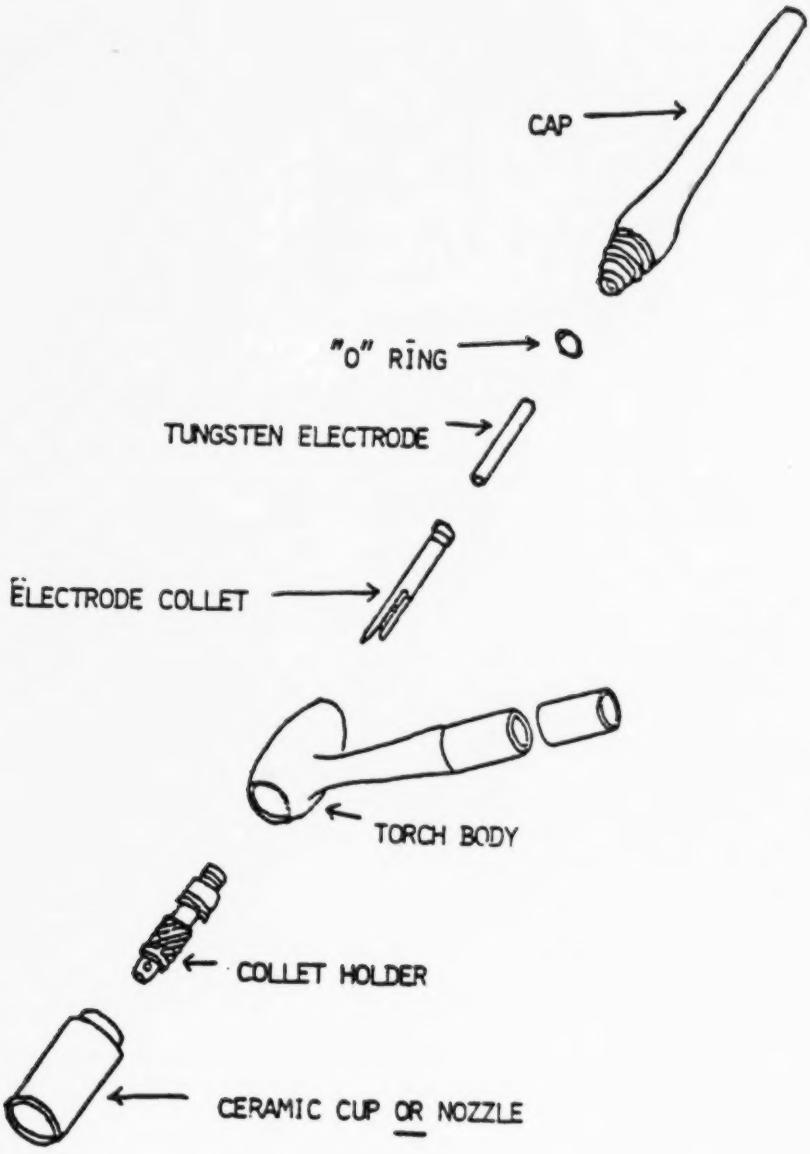
TIG TORCH



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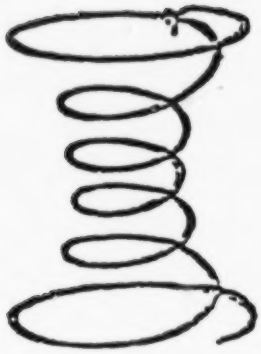
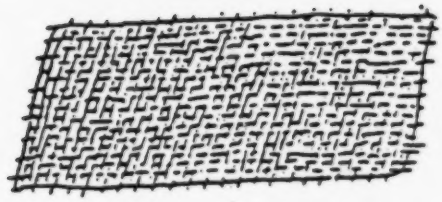
HACIENDA LA PUENTE
UNIFIED SCHOOL DISTRICT

DROP-IN UNIT SUPPLIES

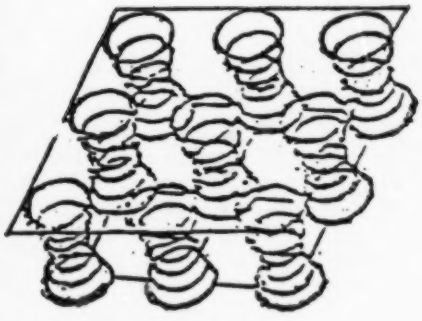


coil spring

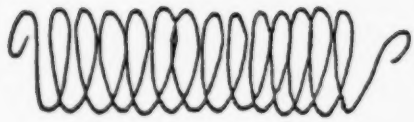
nail



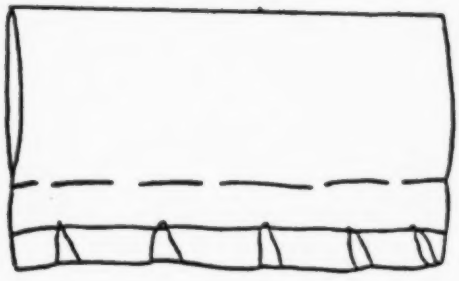
burlap



drop-in unit



helical



fox edging

insert

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.ools and Materials

Assembly ESL
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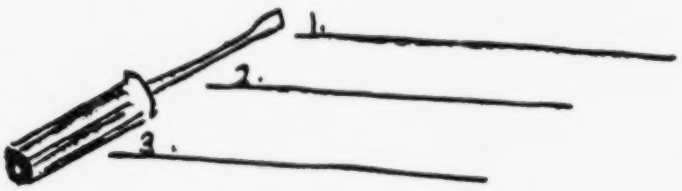
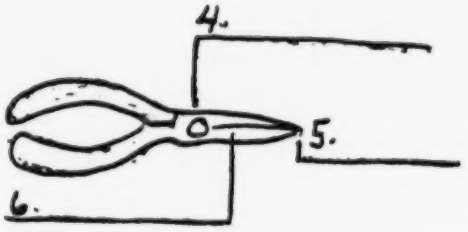
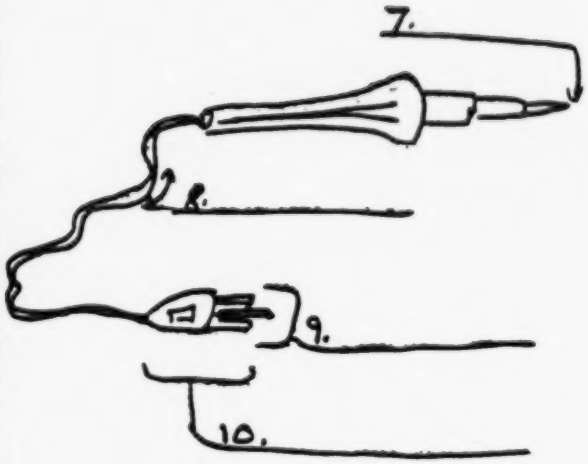
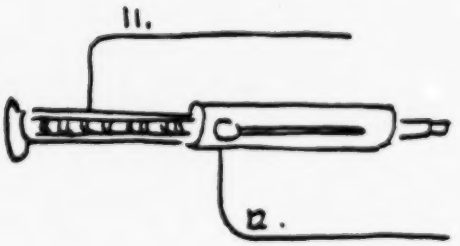
NAME THE PARTS OF THE TOOLS:

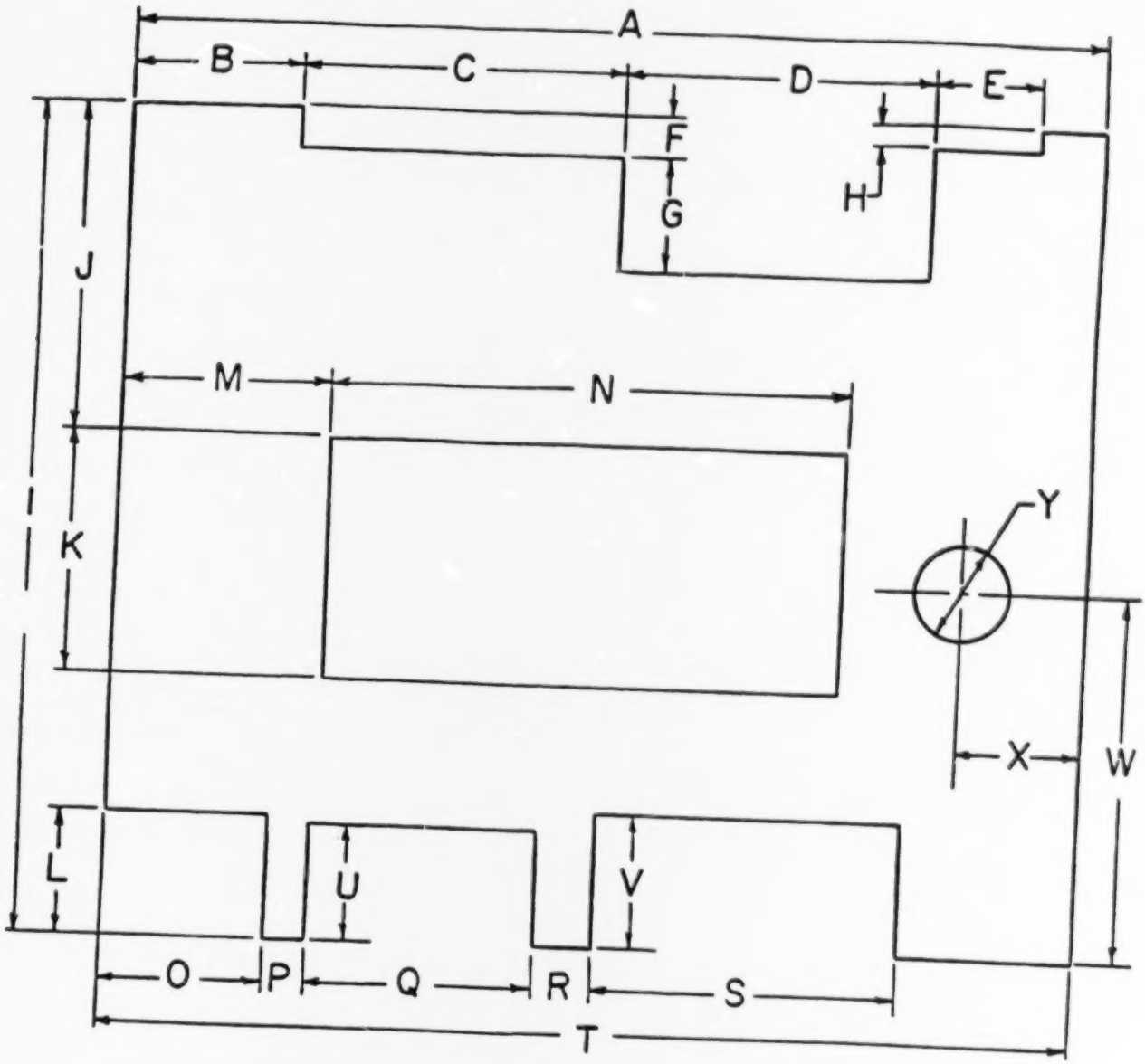








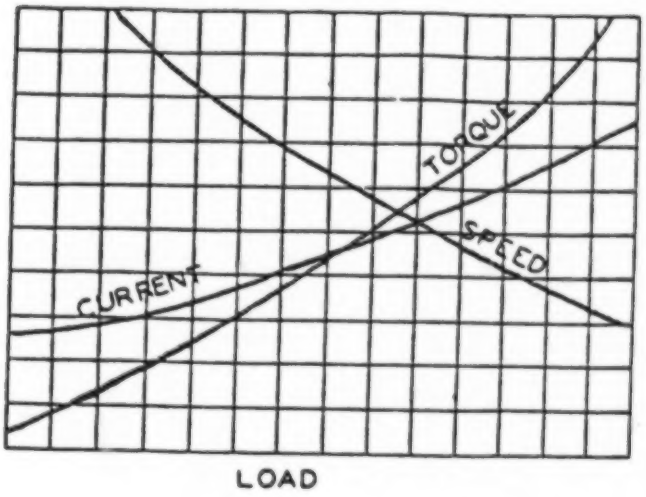
PROBLEM 3: Measure the length of each line and place your answer in the appropriate blank. Reduce fractions to their lowest common denominator.



A	_____	F	_____	K	_____	P	_____	U	_____
B	_____	G	_____	L	_____	Q	_____	V	_____
C	_____	H	_____	M	_____	R	_____	W	_____
D	_____	I	_____	N	_____	S	_____	X	_____
E	_____	J	_____	O	_____	T	_____	Y	_____

from Walker, John R., Arc Welding, Goodheart-Willcox Co., c1977

STARTING MOTORS
Speed and Torque Characteristics



increases - decreases

As the load increases, the current _____.

As the speed decreases, the torque _____.

As the load increases, the speed _____.

As the current increases, the torque _____.

As the load increases, the torque _____.

As the torque increases, the current _____.

high - slow

With heavy loads, series wound motors will operate at relatively _____ speeds.

With light loads, series would motors will operate at relatively _____ speeds.

*Goodheart - Willcox, Automotive Encyclopedia, 1979, pp. 389-390.

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MEASUREMENTS

ASSEMBLY ESL
WILKINSON 9/80

GREEK NUMERICAL PREFIXES USED IN ELECTRONICS:

tera-	10^{12}	=	1,000,000,000,000
giga-	10^{9}	=	1,000,000,000
mega-	10^{6}	=	1,000,000
kilo-	10^{3}	=	1,000
hecto-	10^{2}	=	100
deka-	10	=	10
deci-	10^{-1}	=	0.1
centi-	10^{-2}	=	0.01
milli-	10^{-3}	=	0.001
micro-	10^{-6}	=	0.000001
nano-	10^{-9}	=	0.000000001
pico-	10^{-12}	=	0.000000000001

Exercise:

Write the prefix next to the number.

1. 10 _____
2. 10^{-1} _____
3. 10^{2} _____
4. 10^{-2} _____
5. 10^{3} _____
6. 10^{-3} _____
7. 10^{6} _____
8. 10^{-6} _____
9. 10^{9} _____
10. 10^{-9} _____
11. 10^{12} _____
12. 10^{-12} _____

13. 100 _____
14. .01 _____
15. .1 _____
16. .001 _____
17. 1,000 _____
18. 1,000,000,000 _____
19. 10 _____
20. .000001 _____
21. 1,000,000,000,000 _____
22. .000000000001 _____
23. .000000001 _____
24. 1,000,000 _____

Button Making Process

Double Action Machine

Put the cap in the first die.

Put the fabric over the cap.

Move the cap die under the press.

Pull the handle down firmly over the cap die.

Put the insert in the second die.

Move the insert die under the press.

Pull the handle down over the insert die.

(c) L. West
VESL (VVC)
10/79

Compression Test Strip Story

Remove all dirt from around the spark plugs.

Remove all the spark plugs.

Block the carburetor and choke linkage.

Screw the compression tester hose into the spark plug hole, finger tight.

Connect the compression gauge to the hose.

Crank the engine for about 4-6 revolutions.

Write down the highest reading.

Release the pressure in the gauge and proceed to the next cylinder.

Compare each cylinder reading and diagnose engine.

*From: J.J. Ray, Compression Testing Procedure Sheet

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VESL (VVC)/HLPUSD
6/80

Filling Procedure

1. Rough out the damaged area.
2. Hammer and dolly.
3. Grind the metal to remove the old paint.
4. Mix the bondo and hardener on the bondo board.
5. Spread the bondo evenly over the damaged area.
6. Wait for the bondo to dry. Clean the bondo board, putty knife and spreader with thinner.
7. Grate the bondo when it's nearly dry.
8. Sand the bondo lightly with a sanding block, air file, or speed file.
9. Repeat filling, grating and sanding if necessary.
10. Now the metal is ready for sanding and priming.

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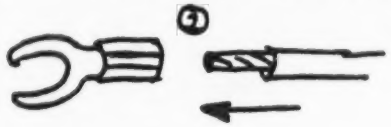
VESL (VVC)/HLPUSD
1/30/80

ELEC. ASSEMBLY ESL
B. WILKINSON
July, 1981

STEPS FOR MAKING A SOLDERLESS CONNECTION

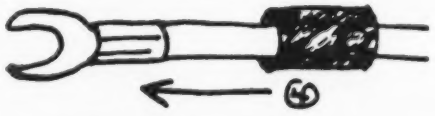
1. Strip the end of the wire.

2. Slip the end of the wire into the shank of the connector.



3. Crimp the shank of the connector onto the wire.

4. Slip a piece of heat shrink tubing over the connection.

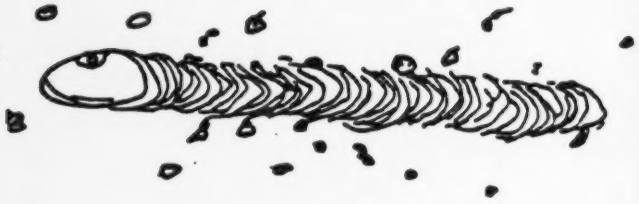


5. Heat the heat shrink tubing with a heat gun.

6. Inspect your work.

Arc Welding Defects

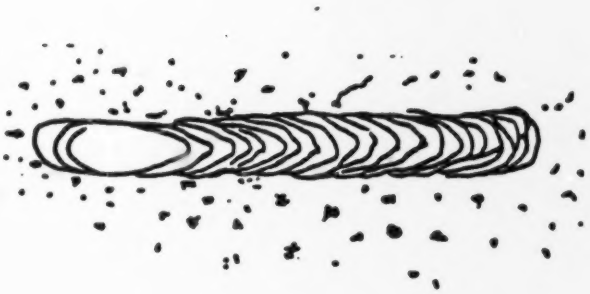
ARC TOO LONG



SPATTER

CURRENT TOO LOW

POOR TIE-IN



CURRENT TOO HIGH

POROSITY

SPEED TOO FAST

HACIENDA LA PUENTE
UNIFIED SCHOOL DISTRICT

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VESL (WC)
7/79

Upholstery Lesson Plan #19 - Sewing Conversation 1, 2, 3, 4

Rationale: Upholstery seamstresses need to respond correctly to directions related to sewing machine use, to express problems with the machine, and to ask confirming questions.

Vocabulary: up, down, clockwise, counter-clockwise, broken, too short, too long, correct, top, bottom, loose, tight

Visuals: symbol flash cards - - "up," "down," "clockwise," and "counter-clockwise;" something broken; flash cards of sewing machine and parts - - foot, bobbin, needle; fabric and vinyl samples with various lengths of stitchs; samples with loose top stitches, loose bottom stitches, and correct stitches.

Procedure, 1:

These sentences will be practiced:
Make sure the foot is down.
Pull the top thread 5 inches out (of the needle).
The bobbin runs counter-clockwise.
The needle's broken.
The machine's broken.

1. T preteaches vocabulary with flashcards and props -- up, down, clockwise, counter-clockwise, broken.
2. T reviews vocabulary with flashcards-foot, bobbin, needle, machine, top thread.
3. T models sentences, demonstrates meaning with flashcards and props.
4. Sentences may be written on board as a memory aid for literate students.
5. T says sentence.
   S repeats sentences, selects and manipulates visuals to show comprehension.

Procedure 2,:

These sentences will be practiced:

The stitch is too short.
too long
correct

vinyl - 5 stitches/inches
fabric - 9 stitches/inches
light fabric - 12 stitches/inches

1. T shows fabric samples, models sentence.
   Ss observe, repeat.
2. T models sentence.
   S repeats, chooses sample described by sentence to show comprehension.

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3. T may write sentences on board to aid literate students.

4. T displays sample.
   Ss respond sentence.

5. T displays sample.
   S responds sentence.

6. Repeat for vinyl samples, very light weight fabric.

Procedure, 3:

These sentences will be practiced:
The top thread is too loose.
The bottom thread is too loose.
The threads are O.K.

1. T shows samples, models sentence.
   Ss observe, repeat.

2. T models sentences.
   Ss repeat, selects sample to show comprehension.

3. T shows flash cards of bobbin use and tension plates.
   T matches bobbin case with "top thread loose" sample, models command.
   "Adjust the bobbin case"
   T matches tension plates with "bottom thread loose: sample, models command.
   "Adjust the tension plates."
   Ss observe and repeat.

4. T says sentence.
   S repeats, selects the appropriate sample, selects the appropriate correction card, says command sentence.

Procedure, 4:

Students will practice asking and answering questions, transforming sentences learned in 1-3.

Cues - questions

(1)
foot	Is the foot down?
top thread	Is the top thread too short?
needle	Is the needle broken?
machine	Is the machine broken?

(2)
short	Is the stitch too short?
long	Is the stitch too long?
correct	Is the stitch correct?

(3)
top thread	Is the top thread too loose?	
bottom thread	Is the bottom thread too loose?	
threads OK	Are the treads OK?	
bobbin case	Do I	adjust the bobbin case?
tension plates	Should I / Do you want me to	adjust the tension plates?

1. T cues with sample, asks questions.
   Ss repeat.

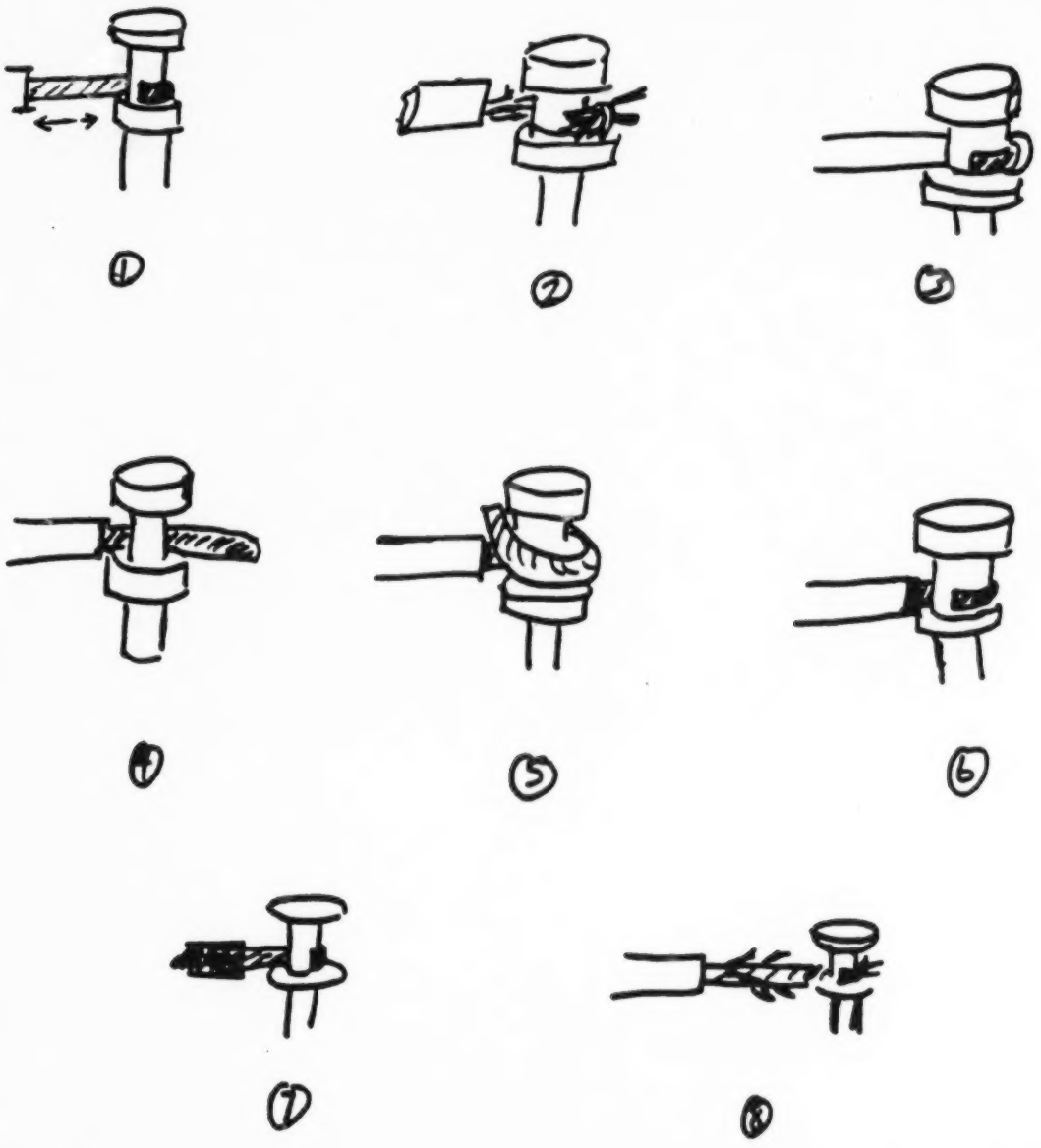
2. T cues with sample.
   S1 asks question.
   [S2 responds yes/no.]

Transparency III-E-#3
© Wilkinson
9/81
Assembly ESL

MECHANICAL CONNECTIONS TO A TERMINAL

(Two workers are talking.)

A: What are you doing?
B: I'm connecting a wire to this turret terminal.
A: I think you should do it again.
B: Oh, why is that?
A: The strip gap is too wide.
B: You're right. I'll cut it and start over.



LANGUAGE REQUIREMENTS

VOCABULARY

SITUATIONS

FUNCTIONS

STRUCTURES

REGISTER

NEEDS ASSESSMENT:

Language Requirements of the Vocations

A. Vocabulary

What words and phrases are used?
Does the worker have to understand these words?
Does the worker have to say the words in questions?
Does the worker have to read the words on signs, labels, in catalogs, orders, manuals and diagrams?
Does the worker have to write the words on orders, reports, notes, requests and employment tests?

B. Situations

Does the worker have to
- -make small talk with customers?
- -get tools/supplies/parts from a supply clerk?
- -report when he has completed an assignment?
- -arrange a schedule?
- -request assistance from a supervisor/instructor?
- -explain an equipment malfunction?
- -report a hazardous condition?
- -explain a procedure to a customer?

C. Functions

Does the worker have to
- -report or describe?
- -ask questions?
- -express agreement or disagreement?
- -clarify instructions?
- -ask permission?
- -make suggestions?
- -make requests?
- -greet people?
- -give advice?
- -check to see if his work is done correctly?

D. Structures

Does the worker have to
- -use specific grammatical structures to perform the above functions?
- -distinguish between future and past actions?
- -use indirect and polite forms?
- -make space and time sequence distinctions?
- -make conditional statements and ask hypothetical questions?

E. Register

Does the worker have to
- -discern which expressions are appropriate in speaking to different groups of people?
  e.g. worker to co-worker/
  worker to supervisor/
  worker to customer/
  worker to subordinate
- -discern language appropriate to different settings?
  e.g. on the job/
  on breaks/
  at social functions/
  in private conversations/
  in groups

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